

U.S. Patent Application Serial No. **09/816,784**
Amendment dated August 8, 2003
Reply to OA of **April 8, 2003**

REMARKS

Claims 1-8 are pending in this application. Claim 8 has been withdrawn from consideration as being drawn to a non-elected invention.

Claims 1, 2, and 4, have been amended to recite that the layer to be etched is a cobalt-platinum alloy layer. Support for this amendment appears in the specification on page 5, lines 1, 6-14, the paragraph bridging pages 9 and 10, and page 11, lines 10-18.

The Applicant's respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **April 8, 2003**.

Favorable consideration is respectfully requested in view of the foregoing claim amendments and the remarks set forth below.

I. At page 2, paragraph 3, of the Office action, claims 1-3 have been rejected as being unpatentable over Araki in view of Kaneki.

The Examiner states that the skilled artisan would have found it obvious to modify the **Araki** method by using a tantalum masking film during dry etching as per **Kaneki** because **Kaneki** teaches that tantalum is a high precision and high durability photomask. In view of the following, this rejection is believed to be overcome.

Claims 1, 2, and 4, have been amended to recite that the layer to be etched is a cobalt-platinum alloy layer.

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Kaneki teaches a multi-layer photomask including a transparent substrate, and a layer of tantalum and a composite layer of tantalum oxide and tantalum nitride formed successively on the substrate. **Kaneki** teaches that prior art multi-layer and single layer films are problematic, for example dimensional variation and occurrence of defects.. See col. 1, lines 56-67 to col.2, lines 1-4. To solve these problems, **Kaneki** provides a multi-layer photomask including a composite layer. The etching gas disclosed is CF_4 or CF_4 and O_2 (col.4, lines 52-53).

Araki discloses a dry etching process including forming a layer to be etched, forming a resist pattern on the layer and dry etching the layer to be etched. **Araki** does not teach or suggest forming a tantalum mask layer on the layer to be etched.

The presently claimed invention requires a tantalum or a tantalum nitride mask, and requires a cobalt-platinum alloy layer to be etched.

The use of a cobalt-platinum alloy layer achieves a very large etching rate ratio (etching selective ratio). Accordingly, the mask itself is not deformed by etching and etching of the work layer from the mask edge due to side etching does not occur. Thus, the fine micro-pattern can be precisely transferred on to the work layer.

Neither **Araki** nor **Kaneki** teach or suggest a single layer tantalum or tantalum nitride mask. Further, neither **Araki** nor **Kaneki** teach or suggest etching a cobalt-platinum alloy layer, as presently claimed.

In fact, **Kaneki** teaches away from using a single Ta film, because Kaneki teaches such films are problematic. **Kaneki** solves such problems by providing a multi-layer mask including a

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composite layer. **Kaneki** does not suggest a single layer mask or a mask not including a composite.

Kaneki does not suggest the presently claimed cobalt-platinum alloy layer.

Araki '098 does not cure the deficiencies of **Kaneki**, because **Araki** also does not suggest a tantalum or tantalum nitride mask, or a cobalt-platinum alloy layer.

In view of the above, it is submitted that nothing in **Araki** or **Kaneki**, taken alone or together, render the claimed invention obvious within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

II. At page 3, paragraph 4, claim 4 has been rejected under 35 USC § 103 as being unpatentable over Araki in view of Lee.

The Examiner states that it would be obvious to substitute the resist mask layer of **Araki** with a TaN mask layer as per **Lee**. In view of the following, this rejection is respectfully overcome.

A brief discussion of **Araki** appears above. **Araki** does not teach or suggest the presently claimed cobalt-platinum alloy layer. **Lee** does not cure the deficiencies of **Araki** because **Lee** also does not teach or suggest a cobalt-platinum alloy layer.

In view of the above, it is submitted that nothing in **Araki** or **Lee**, taken alone or together, render the claimed invention obvious within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

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III. At page 4, paragraph 5, claims 5 and 7 have been rejected under 35 USC § 103 as being unpatentable over Araki in view of Lee and further in view of Ding.

The Examiner states that the skilled artisan would find it obvious to modify **Araki** and **Lee** by sputtering a mask layer TaN using a Ta/TaN target in view of Ding's teaching.

Claims 5 and 7 are dependent on claim 4. A brief discussion of **Araki** and **Lee** appears above. **Araki** does not teach or suggest the presently claimed cobalt-platinum alloy layer. **Lee** does not cure the deficiencies of **Araki** because **Lee** also does not teach or suggest a cobalt-platinum alloy layer. **Ding** does not cure the deficiencies of **Araki** and **Lee**, because **Ding** also does not teach or suggest a cobalt-platinum alloy layer, as presently claimed.

In view of the above, it is submitted that nothing in **Araki**, **Lee**, or **Ding**, taken alone or together, render the claimed invention obvious within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

IV At page 5, paragraph 6, claim 6 has been rejected under 35 USC § 103 as being unpatentable over Araki in view of Lee and further in view of Tao.

The Examiner states that the skilled artisan would find it obvious to modify **Araki** and **Lee** by forming a TaN mask using reactive sputtering in the presence of Ar and nitrogen as per **Tao**.

Claim 6 is dependent on claim 5. A brief discussion of **Araki** and **Lee** appears above. **Araki** does not teach or suggest the presently claimed cobalt-platinum alloy layer. **Lee** does not cure the deficiencies of **Araki** because **Lee** also does not teach or suggest a cobalt-platinum alloy layer. **Tao**

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does not cure the deficiencies of **Araki** and **Lee**, because **Tao** also does not teach or suggest a cobalt-platinum alloy layer, as presently claimed.

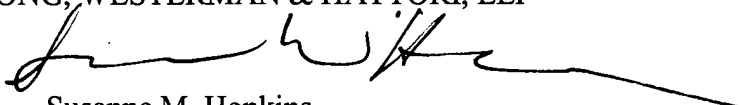
In view of the above, it is submitted that nothing in **Araki**, **Lee**, or **Tao**, taken alone or together, render the claimed invention obvious within the meaning of 35 USC § 103. Accordingly, the Examiner is respectfully requested to withdraw this rejection.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosure: Petition for Extension of Time
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